

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization International Bureau



(43) International Publication Date  
20 January 2005 (20.01.2005)

PCT

(10) International Publication Number  
WO 2005/004818 A3

(51) International Patent Classification<sup>7</sup>: C07D 401/04

(74) Agents: SOMERVILLE, Deborah, A. et al.; Kenyon & Kenyon, One Broadway, New York, NY 10004 (US).

(21) International Application Number:

PCT/US2004/022226

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(22) International Filing Date: 9 July 2004 (09.07.2004)

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
60/485,963 9 July 2003 (09.07.2003) US

Published:

— with international search report

(88) Date of publication of the international search report:  
6 May 2005

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(71) Applicant (for all designated States except US): IM-CLONE SYSTEMS INCORPORATED [US/US]; 180 Varick Street, New York, NY 10014 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): OUYANG, Xiaohu [CN/US]; 2802 Parsons Boulevard, Flushing, NY 11354 (US). KISELYOV, Alexander [UA/US]; 4203 Shorepointe Way, San Diego, CA 92130 (US). CHEN, Xiaoling [CA/US]; 1051 73rd Street, Brooklyn, NY 11228 (US). HE, Hai-Ying [CN/US]; 3552 12th Avenue, Brooklyn, NY 11218 (US). KAWAKAMI, Joel [US/US]; 91 Morris Avenue, West Milford, NJ 07480 (US). PATTAROPONG, Vatee [US/US]; 465 Saint Peter Drive, New Madrid, MO 63869 (US). PIATNITSKI, Evgueni [RU/US]; 868 East 7th Street, Brooklyn, NY 11230 (US). TUMA, Maria, Carolina [BR/US]; 68 Hunt Lane, East Haven, CT 06512 (US). KINCAID, John [US/US]; 9949 Azuaga Street, San Diego, CA 92129 (US).

WO 2005/004818 A3

(54) Title: HETEROCYCLIC COMPOUNDS AND THEIR USE AS ANTICANCER AGENTS

(57) Abstract: The present invention relates to heterocyclic compounds that have anticancer activity, and pharmaceutical compositions that contain such compounds, methods of treating diseases and conditions in mammals using such compounds and composition and methods for their manufacture.

**INTERNATIONAL SEARCH REPORT**

International application No.

PCT/US04/22226

**A. CLASSIFICATION OF SUBJECT MATTER**

IPC(7) : C07D 401/04  
US CL : 546/272.4

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 546/272.4

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)  
CAS Online

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5,284,860 A (OZAKI et al) 8 February 1994 (08.02.1994), see entire document.	1

Further documents are listed in the continuation of Box C.  See patent family annex.

* Special categories of cited documents:	
"A" document defining the general state of the art which is not considered to be of particular relevance	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"E" earlier application or patent published on or after the international filing date	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search 13 December 2004 (13.12.2004)	Date of mailing of the international search report <b>15 FEB 2005</b>
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (703) 305-3230	Authorized officer <i>Patricia L. Morris</i> Patricia L. Morris Telephone No. (571) 272-1600

**INTERNATIONAL SEARCH REPORT**

International application No.

PCT/US04/2222

**Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)**

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1.  Claims Nos.: because they relate to subject matter not required to be searched by this Authority, namely:
  
2.  Claims Nos.: 2-24 because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:  
Please See Continuation Sheet
  
3.  Claims Nos.: because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

**Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)**

This International Searching Authority found multiple inventions in this international application, as follows:

1.  As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2.  As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3.  As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
  
4.  No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

**Remark on Protest**  

The additional search fees were accompanied by the applicant's protest.

No protest accompanied the payment of additional search fees.

**INTERNATIONAL SEARCH REPORT**

International application No.

PCT/US04/22226

## Continuation of Box II Reason 2:

In these claims, the numerous variables and their voluminous, complex meanings and their seemingly endless permutations and combinations make it virtually impossible to determine the full scope and complete meaning of the claimed subject matter. As presented, the claimed subject matter cannot be regarded as being a clear and concise description for which protection is sought and as such the listed claims do not comply with the requirements of PCT Article 6. Thus it is impossible to carry out a meaningful search on same. A search will be made on the first discernable invention, i.e., compound no. I in Table I.